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RAPISTRUM IN NORTHERN NORTH AMERICA

Robert T. Clausen

While botanizing with Harold Trapido on the gravelly shore of Métis Bay, Matane County, Quebec, on August 24, 1937, I collected an unfamiliar crucifer. Search in Gray's *Manual* and in Marie-Victorin's *Flore Laurentienne* failed to reveal the identity of the plant. Only after considerable investigation did I finally recognize it as a member of the Old World genus, *Rapistrum*, characterized by the indehiscent, two-jointed siliques. The plant was *R. rugosum* (L.) Allioni. This species was reported by Britton and Brown (1897) and by Porter (1903) from Northampton County, Pennsylvania, and from ballast about seaports; by Knowlton and Deane (1916) from the Boston District; by House (1924) as an occasional ballast plant about New York City and on Staten Island; and by Groh (1933) from Montreal.

To determine the present status of *Rapistrum* as a weed in the northern United States and Canada, I secured all the information available from specimens in several eastern American herbaria. In this study, I am indebted for the loan of specimens and for reports on collections to the authorities at the Gray Herbarium (GH), the Missouri Botanical Garden, the New England Botanical Club (NEBC), the University of North Carolina, the New York Botanical Garden (NY), the Academy of Natural Sciences at Philadelphia, the United States National Herbarium (US), and Cornell University (CU); also to Dr. Herbert Groh, Botanist at the Central Experimental Farm, Ottawa. Review of the available evidence indicates that three

species of *Rapistrum* have been collected as weeds in North America and that the genus has been found in six states and two Canadian provinces.

In his monograph of the genus, O. E. Schulz (1919) recognized three species. I have followed him in maintaining the three species, but am doubtful concerning the specific distinctness of *R. hispanicum* and do not consider the variations of *R. rugosum* worthy of nomenclatorial recognition. The following key, showing some of the characters by which the species are separated, is adapted from Schulz.

A. Lower joint of the silique stout, scarcely more slender than the upper; beak conical, short, 0.5–1 mm. long ..... 1. *R. perenne*
AA. Lower joint of the silique much more slender than the upper; beak filiform, elongate, 1–5 mm. long ..... B
B. Fruiting pedicels 1–6 mm. long, enlarged upwards, 0.75–1.5 mm. thick, suberect ..... 2. *R. rugosum*
BB. Fruiting pedicels 6 mm. long or more, slender, not enlarged upwards, 0.5 mm. thick, more or less recurved 3. *R. hispanicum*

1. Rapistrum perenne (L.) Allioni. This has been reported by Groh (1933) as securely established as a field weed in the region of Grenfell, Saskatchewan. Groh has discussed the characteristics of this species and methods of control.

2. Rapistrum rugosum (L.) Allioni. Weed in waste places and on ballast. Quebec: Métis, Matane Co., *R. T. Clausen* & *H. Trapido, 3127* (CU); also reported from Montreal by Groh (1933). Massachusetts: Boston, *C. E. Faxon* (GH); Charlestown, Suffolk Co., *C. E. Perkins* (NEBC). New York: New York, *A. Brown* (GH). New Jersey: Jersey City, *A. Brown* (NY). Pennsylvania: Easton, *T. C. Porter* (GH). California: San Francisco, *M. A. King* (US1434864). Oregon: Linnton, Multnomah Co., *W. N. Suksdorf 1703* (GH).

3. Rapistrum hispanicum (L.) Crantz. Ballast plant. Oregon: Linnton, Multnomah Co., *W. N. Suksdorf 1920* (GH).

Bailey Hortorium,
Cornell University, Ithaca, N. Y.

Literature Cited

Britton, N. L., and Brown, A. 1897. *Rapistrum*, in Illustrated Flora. **2**: 140.
Groh, Herbert. 1933. *Rapistrum* spp., in Some recently noticed mustards. Scientific Agriculture **13**: 726–727.
House, H. D. 1924. *Rapistrum*, in Annotated list of the ferns and flowering plants of New York. N. Y. State Mus. Bull. 254. p. 357.
Knowlton, C. H. and Deane, Walter. 1916. *Rapistrum*, in Flora of the Boston District. Rhodora **18**: 220.
Porter, T. C. 1903. *Rapistrum*, in Flora of Pennsylvania. p. 152.
Schulz, O. E. 1919. *Rapistrum*, in Das Pflanzenreich 4. 105. p. 252–261. fig. 32.

SPERGULARIA IN NORTH AND SOUTH AMERICA

Ruth P. Rossbach

(*Continued from page 193*)

38. S. GRANDIS (Pers.) Camb. (PLATE 596, FIGS. 1a–1c and MAP 32). Perennial with a heavy tap root: *caudex* bearing 2 or more nearly erect stems, 25–40 or more cm. long; *internodes of stem below the inflorescence usually very long* (10–84 mm.), 2–2.5 mm. in diameter, glabrous or sometimes with sparse glandular pubescence above: *leaves fascicled*, mucronate, usually glabrous, 25–60 mm. long, 1–2 mm. wide; *stipules* broadly lance-acuminate, 3–5.5 mm. long: *inflorescence* an open cyme with large flowers, glandular-pubescent throughout; the *internodes* 7–50, usually 20–30 mm. long; *bracts* minute, 1.5–3 mm. long: *sepals* broadly linear, *glandular-pubescent*, 5 mm. long; *petals* ovate, white, 3–4 mm. long; *stamens* 8; *styles* 4–5, 0.8–1 mm. long, separated to the base: *mature capsules 4–5-valved*,[1] 7–8 mm. long, exceeding the calyx by 2–3 mm.: *fruiting pedicels* not reflexed, the lower 7–20 mm. long: *seeds dark brown, nearly black, shining, rounded in outline, rigid-papillose or not, surface sculptured in crowded interwoven vermiform pattern*, 0.6–0.8 mm. long, *surrounded by a brown-tinged wing with entire margin*, 0.4–0.6 mm. wide.—In St. Hilaire, Fl. Bras. ii. 177 (1829); G. Don, Gen. Hist. Dichl. Pl. i. 426 (1831), in part, including synonym *Spergula grandis* Pers. and excluding *Arenaria grandis* HBK.; Rohrb. in Mart. Fl. Bras. xiv. pt. ii. 271 (1872), in part (including the 5-merous element of the description and the two synonyms *Spergula grandis* Pers., "forma pentagyna," and *Spergularia grandis* (Pers.) Camb.; but excluding the synonyms *Arenaria grandis* HBK., and DC. "forma trigyna," *Spergularia macrocarpa* Presl and *Lepigonum grande* (Pers.) Kindb., all three of which are *S. ramosa;* also excluding *L. arenarium* Kindb. which is a mixture of *S. ramosa* and *S. villosa*); Rohrb. in Linnaea xxxvii. 236 (1871–73) in part, for the same reasons as above; Arech. in Anal. Mus. Nac. Montevideo, iii. (Fl. Uruguay) i. 95 (1901); Macbride, Field Mus. Pub. Bot. xiii.—Fl. Peru, pt. 2. no. 2, 631 (1937), as to source of name but not as to plants discussed.[2] *Spergula grandis* Pers. Syn. i. 522 (1805); Poiret, Enc. vii. 305 (1806); D. Dietr. Syn. Pl. ii. 1598 (1840). *Arenaria grandis* (Pers.) HBK. Nov. Gen. and Sp. vi. 24 (1823), as to source of name, not as to plants discussed which are *S. ramosa*, "Vidi in A. grandi stamina 10 et stylos tres;" *Arenaria grandis* DC. Prod. i. 401 (1824), in part, including references Pers. and Poir., excluding HBK.; Steud. Nom. Bot. ed. 2, i. 124 (1840), in part, including references Pers., and excluding HBK. and Presl; Gay, Fl. Chile, i. 267 (1845), as to source of name in part (*i. e.* DC.; see above under *Arenaria grandis*), not as

[1] In one case (see citations), a collection having otherwise the characteristics of *S. grandis* has 3 valves to the capsule.

[2] *S. grandis* does not grow in Peru—the Haenke specimen cited is *S. ramosa* l. c. and "Ruiz and Pavon, without locality," has not been seen by the author.

to plant described (*S. macrocarpa* Presl is true *S. ramosa*). *Lepigonum grande* (Pers.) Kindb. Syn. Lepig. 15 (1856), as to source of name, but not as to the reference *S. macrocarpa* Presl which pertains to *S. ramosa*.[1] *Spergularia levis* sensu Rohrb. in Mart. Fl. Bras. xiv. pt. ii. 270, fig. 62 (1872), in part (because, according to description, the plant may have pubescent calyces, 5-valved capsules (see fig.), or entire winged seeds (all of which characterize *S. grandis*) and because a *Sello* collection from Brazil with no definite locality cited and marked *S. levis* by Rohrbach is *S. grandis*), non Camb. (1829). *Spergularia platycaulis* Bartl. ex Rohrb. in Mart. Fl. Bras. xiv. ii. 271 (1872), manuscript name given as a synonym of *S. grandis* (Pers.) Camb.; Bartl. ex Rohrb. Linn. xxxvii. 237 (1871–73), same as above. *Tissa grandis* (Pers.) Morong & Britt. in Ann. N. Y. Acad. Sci. vii. (Enum. Pl. Coll. Morong in Paraguay), 53 (1892), as to source of name, not as to plants discussed (citations Morong 921 = *S. ramosa* var. *diffusa* and Buenos Aires 3 = *S. villosa*); Meigen in Bot. Jahrb. xvii. 235 (1893), as to source of name but not as to plant discussed[2] which grows in Chile; Chod. & Hassl. in Bull. Herb. Boissier, ser. 2, iii. (Pl. Hassl. ii.) 171 (renumb.) 1903, as to source of name but at least in part not as to plants cited (Hassler 1188 = *S. ramosa* var. *diffusa;* Campo Cerrito n. 924a not seen). *Buda grandis* (Pers.) Kuntze, Rev. Gen. iii. pt. 2, 13 (1898), as to source of name but not as to plants discussed (citations Buenos Aires, Argentina, *Hauthal* 661 and Sierra de Solis, Uruguay = *S. levis;* Cochabamba, Bolivia and Rio Santa Lucia, Uruguay = *S. ramosa;* Ceres, Cordoba, Argentina = *S. ramosa* var. *diffusa*); not Macloskie in Rep. Princeton Univ. Exp. Patagon. viii. i. pt. 5, 395 (1905) which is probably *S. ramosa.*— South America: southeastern Brazil and Uruguay. Brazil: Prov. Santa Catharina: sandy sea coast, San Jose, *Ule* 472, October, 1886 (B., by using the date, locality fixed from Itiner. Ule in Mart. Fl. Bras. i. pt. 1. 125). Prov. Rio Grande do Sul: in pastures, Estancia Santo-Rei near San Francisco de Borja, *St. Hilaire* 2683 bis, March, 1821 (Paris, photo. in G.). Brazil, without stated locality: *St. Hilaire* (B., marked *Spergula grandis* Pers. by Kindb. 1861); *Sello* 3961[3] (B., 2 sheets, one marked *Spergula grandis* Pers. by Kindb., 1861); *Sello* 3727[3] (B., 2 sheets); *Sello* 3777[3] (B.); *Sello* (B., no data, marked *Spergularia levis* Camb. by Rohrbach); *Sello* (K., no data, mounted on a sheet with *Alsine marina* in Herb. Hook.); native of fields and plains, observed in flower in May, *Sello,* no number (K., the capsules with 3 valves, yet the seeds typical); *Sello* (Leiden, no data,

[1] Kindberg in his later Mon. Lepig. 18 (1863) excludes *Spergula grandis* Pers. from *Lepigonum* because it has 5 valves to the capsule.

[2] From Chile—3100–3200 m. (5.2.92.bl.n.425); although specimen has not been seen by the author, it cannot be *S. grandis.*

[3] According to the biographical sketch of *Sello* by Urban in Engler, Botanischer Jahrbucher, xvii. 196 (1893), collection comprising numbers "3624–4097 ebenda von Alegrete über die Misiones durch den nördlichen Teil des Staates nach Porto Alegre (Mai–Nov. 1826)."

plant typical). URUGUAY: Montevideo, *Commerson* (Paris, TYPE presumably, photo. in G., not marked by Persoon, but from Herb. Juss. 13052).

This species is closely related to both *S. ramosa* and *S. levis*, having characters of both. The seed-body is like that of *S. levis* but the wing is like that of *S. ramosa*. The plant has long internodes both below and within the inflorescence, as does *S. levis*, but it has pubescent calyces as in *S. ramosa*. The capsule exceeds the calyx by 2–3 mm. as does that of *S. levis*, while that of *S. ramosa* is about equal to the calyx. *S. grandis*, however, has one distinctive character, one which is anomalous in the genus, 4–5 valves to the capsule. The range of *S. grandis* is roughly within the ranges of both *S. ramosa* and *S. levis*. These facts should provoke cytogenetic experiments.

39. S. **pazensis** (Rusby), comb. nov. (PLATE 596, FIGS. 5a–5c and MAP 33). Perennial: *caudex* well developed, branched and knotted, bearing from 3–∞ diffuse stems, 10–45 cm. tall; *internodes of stem below the inflorescence* always glandular-pubescent, 7–50 mm. long, 0.8–1.5 mm. in diameter: *leaves* fascicled, mucronate, the upper usually glandular-pubescent, the lower often glabrous, 7–35 mm. long, 0.4–1 mm. wide; *stipules* broadly lanceolate, acuminate, 4–7 mm. long: *inflorescence a lax cyme* with densely glandular-pubescent *internodes* 8–40 mm. long, 0.4–0.8 mm. wide and densely pubescent *bracts* 1–7 mm. long: *sepals* linear, acute, densely covered with long, spreading glandular pubescence, often purple-tipped, 5.8–10 mm., usually 6–8 mm. long; *petals* white, ovate, 4–6 mm. long, as much as 1–2.4 mm. shorter than the calyx; *stamens* 7–10; *styles* 3, separate to the base, 1–1.8 mm. long: *mature capsules* 6.2–8.4 mm. long, equal to or as much as 0.2–2 mm. longer than the calyx:[1] *fruiting pedicels* filiform, glandular-pubescent, never reflexed, 3–30 mm., usually 10–30 mm. long: *seeds pyriform, dark brown or black, glistening, surface deeply sculptured in vermiform pattern but often so molded as to obscure the definite pattern of the depressed sculpture, usually covered with large, dark papillae*,[2] which are occasionally confined to the swollen rim, 0.8–1 mm. long, *usually surrounded by a nearly entire, broad, white wing*, 0.3–0.4 mm. wide, *with a blackish zone next to the seed*, occasionally surrounded by a very narrow, black, heavy rim.—*Tissa villosa* (Pers.) Britt. in Bull. Torr. Bot. Club xvi. 62 (1889), as to plant but not name. *Tissa pazensis* Rusby in Bull. New York Bot. Gard. vi. 503 (1910). *Spergularia villosa* (Pers.) Buchtien, Contrib. Fl. Bolivia pt. 1. iii. (1910), as to plant but not name.—SOUTH AMERICA: Found only in Bolivia. BOLIVIA: DEPT. LA PAZ: 10,000 ft. near La Paz, *Rusby* 1180, April, 1885 (N. Y., G.);[3] stony cliff, 3500 m. alt.,

[1] In one case the capsule is shorter than the calyx, i. e. Unduavi Valley, *Bro. Julio* 495.

[2] Rarely with no papillae, i. e. Totora, *Herzog* 2037a, which is the only example.

[3] Cited under *Tissa villosa* by Britt. in Bull. Torr. Club, xvi. 62 (1889).

La Paz, *Pennell* 14223, May 19–20, 1925 (F. M.); 11500 ft. alt., La Paz, *Williams* 2336, August 20, 1907 (N. Y., TYPE, U. S.); arid slopes, 3750 m., La Paz, *Buchtien* 520, 520a, December 14, 1918 (N. Y., F. M., U. S.); 547, same locality and date (N. Y., F. M.); alt. 3800 m., La Paz, *Buchtien* 520, December 12, 1919 (F. M.); about 3600 m. alt., La Paz, *G. Hammarlund* 482, 20/4–10/5, 1934 (N. Y., F. M.); 12–13000 ft. alt., La Paz, *R. Pearce*, May, 1865 (K.); brushwood formation 3700 m. alt., La Paz, *Troll* 4342, September 5, 1926 (B., immature); La Paz, *Seler* 118, June 20, 1910 (B., immature); La Paz, *Rose* 18904, August 15, 1914 (U. S.); dry mountain slope, 3800 m. alt., La Paz, *Buchtien* 9, May 20, 1906 (U. S.); Unduavi, *Bro. Julio* 387 (U. S.); sunny slopes about 3700 m. alt. at La Paz, *Th. Herzog* 2451, September, 1911 (B., immature); 2360 m. alt., base of Mt. Illimani, Rio Palea Valley, *Bro. Julio 51* (U. S., immature); 2600 m. alt., Unduavi Valley, *Bro. Julio* 495 (U. S.); Talca Chugiaguillo, *Bang* 814, April, 1890 (N. Y., B., U. S., G.); 10,000 ft. alt., Sorata, *G. H. H. Tate* 767, May 1, 1926 (N. Y.); 6,000 ft. alt., Yungas, *Rusby* 1181, 1885 (N. Y., G., U. S., immature but of lax habit, cited as *Tissa villosa* (Pers.) by Britton).[1] DEPT. COCHABAMBA: 3000 m. alt. on Rio Tapacari, *Kuntze*, March 19, 1892 (N. Y., immature but with short internodes, marked *Buda grandis* by Kuntze); on high plateaus about 3000 m. alt., Totora, *Th. Herzog* 2037a, April, 1911 (Leiden, lax inflorescence). DEPT. TARIJA: 3500 m. alt., Escayache bei Tarija, *Fiebrig* 2793, March 29, 1904 (F. M., B., short internodes and inflorescences, habit like the average *S. ramosa*).

Generally distributed as *Tissa villosa* (Pers.) Britt.

There is a remarkable similarity between *S. pazensis* and *S. ramosa*. The measurements of leaves, stipules, internodes of the lower part of the stem and the first node of the inflorescence, sepals, petals, and capsule are practically the same. Yet the species separate at once upon examination of the seed-characters. The seeds of *S. pazensis* are black or nearly so, 0.8–1 mm. long, pyriform in outline, covered with large, black, hardened papillae, and surrounded by a wing 0.3–0.4 mm. wide. *S. ramosa* has light brown, non-sculptured seeds, rounded in outline, 0.7–0.8 mm. long, with a wing usually 0.4–0.6 mm. wide, and sometimes with light brown papillae. There are no transitions between these two easily recognizable types of seeds. In addition, the length of the inflorescence of *S. pazensis* is often much greater and the pedicels much longer than those of *S. ramosa*. The lower internodes of *S. pazensis* are generally longer than those in the majority of the collections of *S. ramosa*. Even though these latter differences are only ones of degree, *S. pazensis* has generally a more lax, sprawling habit.

[1] Britt. Bull. Torr. Bot. Club, xvi. (Enum. Pl. coll. Rusby in So. America 1885–1886), 62 (1889).

Examination of Bolivian collections of *S. ramosa, q. v.* shows a tendency toward this sprawling, open habit seen in the following collections: Cochabamba, *Kuntze*, March 26, 1892; Cochabamba, *Bro. Julio II* 262; Cochabamba, *Parodi* 10193; Ceritos, *Lillo* 4007. However, collections from Sorata, *Williams* 1541 and *Mandon* 946, are more characteristic of *S. ramosa.* It is interesting to note that the following collections of *S. pazensis* because of either short, compact inflorescences or short internodes below (or both) show a tendency toward *S. ramosa:* La Paz, *Troll* 4342; La Paz, *Herzog* 2451; part of Talca Chugiaguillo, *Bang* 814; Tarija, *Fiebrig* 2793; La Paz, *Buchtien* 547.

40. S. RUPESTRIS Camb. (PLATE 596, FIGS. 3a–3c and MAP 34). Perennial, glandular-pubescent throughout: *caudex* bearing 1–? stems, 20–30 cm. tall; *internodes of stem below the inflorescence* 5–15 mm. long, 0.6–1.4 mm. in diameter: *leaves filiform,* densely glandular-pubescent, very strongly mucronate, *fascicled,* 10–25 mm. long, 0.3–0.5 mm. wide; *stipules* broadly lanceolate, *very large and persistent on the old stems,* acuminate, 4–8 mm. long: *inflorescence* a few-flowered, lax cyme, *internodes* 6–11 mm. long, densely glandular-pubescent; *bracts* foliaceous below, becoming minute above, 2–10 mm. long: *sepals* linear, acute, densely glandular-pubescent, 5.4–6.4 mm. long; *petals* white, ovate, 4.6–5.8 mm. long, always shorter than the calyx by 0.2–1 mm.; *stamens* 7–10; *styles* 3, united over half way up or separated to the base, 1–1.2 mm. long: *mature capsules* 4.2–6.8 mm. long, equal to or as much as 0.8 mm. shorter or longer than the calyx; *fruiting pedicels* filiform, densely glandular-pubescent, the lowest 8–12 mm. long: *seeds* 0.7–0.8 mm. long, *light brown, rounded in outline, surface smooth or slightly roughened, not sculptured, densely covered with brown papillae, with a narrow scarcely erose wing,* 0.1–0.3 mm. wide, often with a brownish zone next to the seed.—In St. Hilaire, Fl. Bras. ii. 176 (1829); G. Don, Gen. Hist. Dichl. Pl. i. 426 (1831); not *S. rupestris* Lebel, Rech. Pl. Ile de Manche, 12 (1848);[1] Steud. in Flora, 424 (1856), as to source of name but not as to plants cited, *Bertero* 810 and 58, which are *S. villosa;* Philippi, Anal. Univ. Chile, lxxxi. 771 (1892), as to source of name, not plants which are *S. villosa* (see Steud. above). *Spergula rupestris* (Camb.) D. Dietr. Syn. Pl. ii. 1598 (1840). *Lepigonum trachyspermum* Kindb. Mon. Lepig. 31, t. ii. fig. 16 (1863), in part,

[1] *Spergularia rupestris* Lebel is an entirely different European plant and no reference is made to Cambessedes' work. Lebel, Revis. du Gen. Spergularia from Mém. Soc. Imper. Sci. Nat. Cherbourg, xiv. 23 (1868), renamed his European plant *S. rupicola.* The following references are synonymous with *S. rupicola* Lebel: *Lepigonum rupestre* (Lebel) Kindb. Synop. Lepig. 8 (1856) and Mon. Lepig. 29 t. ii, fig. 13 (1863), excluding only the citation Montevideo Am. Mer., *Sello* (B.), one of which specimens was marked *L. rupestre* (Lebel) Kindb. 1861 and is really *S. marina* (L.) Griseb., *q. v.; Corion rupestre* (Lebel) N. E. Brown in Syme, Engl. Bot. ed. 3. Suppl. 49 (1891); *Alsine rupestris* (Kindb.) Druce in Ann. Scot. Nat. Hist. 221 (1906).

(part of the Montevideo, *Sello*, collections marked *L. villosum*—a synonym according to Kindberg of *L. trachyspermum*—are *S. rupestris*). *Lepigonum trachyspermum* * subsp. *murale* Kindb. Mon. Lepig. 31, t. ii. fig. 17 (1863) in part (including only the right-hand figure with a winged seed and the citation, Montevideo, *Sello*, which specimen was marked *L. murale* by Kindberg, 1861, excluding the left-hand figure and the European plants discussed which are all *S. rupicola* Lebel). *Spergularia villosa* var. α. *genuina* Rohrb. in Mart. Fl. Bras. xiv. pt. ii. 268, t. 69, fig. 1 (1872), in part (including the reference *L. murale* Kindb. and the right-hand narrow-winged seed in figure and the part of the description dealing with seeds rarely narrowly winged; the remaining information referring to *S. ramosa, q. v.*); Rohrb. in Linnaea, xxxvii. 238 (1871–73), in part (including the reference *L. murale* Kindb. and citation Pâo de Assucar near Maldonado, *St. Hilaire* and the narrow-winged seeds of description, excluding all the other references and probably all the other citations which all belong with *S. ramosa, q. v.*). *S. villosa* var. γ *rupestris* (Camb.) Rohrb. in Mart. Fl. Bras. xiv. pt. ii. 269, t. 61, fig. 1 (1872), including only the narrow-winged seed in the figure; Rohrb. in Linnaea, xxxvii. 240 (1871–73); Arech. in Anal. Mus. Nac. Montevideo, iii. (Fl. Uruguay, i.) 94 (1901).[1]—SOUTH AMERICA: only in Uruguay, evidently in rocky habitats. URUGUAY: DEPT. MALDONADO: 200–500 m. alt., Sierra Animas, Pan de Azucar, *Herter* 2119, February, 1907 (B.); 0–300 m. alt., Pan de Azucar, *Herter* 2135, February 25, 1907 (B.); 0–300 m. alt., Pirapolis, *Herter* 10436, October 10, 1907 (B., immature); inter saxa, Punta Ballena, *Herter* 652c, December 27, 1931 (G.); Banda Oriental del Uruguay, *St.-Hilaire* 2063?, rochers nus, Bragados and 2141 ter, with no definite locality (Paris, TYPE COLLECTIONS?[2], photo. in G., one label—left-hand—has only *Spergularia rupestris* +[3] probably in Cambessedes' handwriting,[4] the other has the same in the hand of Spach); rochers nus, Bragados, *St. Hilaire* 2063 ter (B., marked *Lepigonum arenarium* Kindb. 1861). DEPT. MONTEVIDEO: Montevideo, *Sello* d.2[5] (also R. v. Campos-Victoria) (B. 2 sheets; K., probably d.21, only part of the plants on each sheet); Montevideo, *Sello* d394 (B., 3 sheets,[6] one marked *L. murale* Kindb. 1861 and *Spergularia villosa* (Pers.) Camb. by Rohrbach). BRAZIL:

[1] *Buda rupestris* F. Hanb. Lond. Cat. Pl. ed. 9, 12 (1895), *nomen nudum*.

[2] The type locality given in St. Hilaire, Fl. Bras. ii. 176 (1829) is: cracks of rocks at base of Mt. Pâo de Assucar not far from the city Maldonado "in parte orientali provinciae Cisplatinae"; this evidently does not appear upon any specimens located at the Paris Museum. Photo. and data by courtesy of Mr. C. A. Weatherby.

[3] The + may be used for the same reason as the dagger (†) used after new species in St. Hilaire, Fl. Brasiliensis.

[4] Fide Mr. C. A. Weatherby.

[5] Locality found more definitely from Urban, in Engler, Bot. Jahrb. xvii. 177 (1863), *Sello*—"d. 1–740 im südlichen Teile von Uruguay (1821–22)."

[6] Cited under *Lepigonum trachyspermum* subsp. *murale* Kindb., Mon. Lepig. 31, t. 2, fig. 17 (1863) and cited under *S. villosa* var. α. *genuina* Rohrb. in Mart. Fl. Bras. xiv. pt. ii. 268 (1872).

no locality, *Sello* (Leiden, probably the same as one of the Montevideo (*Sello*) collections).

This species is easily confused with *S. villosa* in general habit but differs from it in having longer sepals, a longer style, and larger, light brown, narrowly winged seeds. It is more easily confused with *S. fimbriata* of the Canary Is. but differs in having white instead of rosy petals, densely glandular-pubescent instead of smooth or nearly smooth leaves and light brown seeds with entire-margined wing, smooth surface, and widely spaced papillae, as opposed to black seeds with fimbriate wing, strongly pebbled surface and more minute, crowded papillae. The two species are similar in length of sepals, capsules, stipules, and size of seed.

Rare Exotics

S. Dillenii Lebel (probably). Like *S. marina* except that the seeds are often more reddish-brown, tinged with silver, more densely papillose, and with a more roughened surface.—Revis. Gen. Spergularia in Mém. Sci. Nat. Cherb. xiv. 43 (1868).—South America: introduced from Europe into Chile. Chile: Prov. Talca: Ilico, *Barros* 268, October 19, 1938 (G.). Prov. Santiago: 500 m., Batuco, *Looser* 3452 (G., Cal. Acad.) and 3450 (G.), October 3, 1936; Batuco, *Looser* 3455, November 8, 1937 (G.); Batuco, *Philippi* 1864 (G.). Prov. Coquimbo: Ovalle, *Claude-Joseph* 5196, October, 1927 (U. S.); Ovalle, *Barros* 247, September 22, 1927 (G.); La Serena, Punta de Teatinos, *Werdermann* 874, November, 1925 (G., U. S., N. Y., Cal. Acad., B., F. M.).

I am indebted to Dr. Eugène Simon of Tours, France for this identification. Dr. Simon says of the collections, *Werdermann* 874, and *Looser* 3452, "ne sont pas exactement le *Dillenii*, mais j'estime qu'ils doivent lui être rattachés."

Since the author has been able to gain only a cursory knowledge of European species, all that can be done is to mention again the similarity of this plant to *S. marina* and to wonder what its relationships are in its native home.

S. ? A heavy, large-flowered, glandular-pubescent perennial: *leaves* fascicled; *stipules* broadly lanceolate-acuminate, 4–5 mm. long: *sepals* heavily glandular-pubescent, 5–6.6 mm. long; petals white, 6 mm. long: *mature capsules* very large, 6–8 mm. long: *seeds* dark brown, nearly black, with a silvery tinge, deeply sculptured in areolar, vermiform pattern, covered with widely spaced, hard, black papillae or not, 0.7–0.8 mm. long, surrounded by a white, scarious wing, 0.1–0.2 mm. broad.—South America: introduced perhaps from Australia to the coast of Chile. Chile: Prov. Aconcagua: Valparaiso,

Jaffuel 948, October, 1910 (G.); Algarrobo, Punta de Talca, *Barros* 265, January, 1914 (G.); Prov. Aconcagua, *Philippi*, 1862 (B.). Prov. Santiago: San Antonio, *Claude-Joseph* 297, November, 1924 (U. S.). Prov. ? : Costa, *Claude-Joseph* 1229, November 4, 1920 (U. S.).

It is probable that these plants are introduced because they occur only in ports in central Chile. However, among the meagre collections of foreign Spergularias which I have been able to see, one from South Australia: Port Adelaide, roadside, *Mrs. Sabine Helms* 21, Oct. 1928 (U. C.) seems a fair match; but it may be introduced there also. At present, nothing definite can be said as to a name for these plants. It can be said that they are distinctly different from *S. rupicola* and *S. media* of Europe in type of seeds but similar in habit.

Doubtful Names

Lepigonum chilense Fisch. & Meyer, Ind. Sem. Hort. Petr. iii. 14 (1837), *nomen nudum.*

Melargyra purpurea Rafinesque, Fl. Tellur. iii. 81 (1836), *nomen nudum.*

Melargyra rosea Rafinesque, l. c. The description given might fit any rose-flowered *Spergularia* of the region. Type not found.

Spergularia araucana Philippi in Anal. Univ. Chil. lxxxi. 764 (1892). Type not found in Museo Nacional, Santiago, Chile.

Spergularia cerastiodes Foucaud mss. ex H. Ross in Oesterr. Botan. Zeitschr. lvii. 451 (1907), based on a collection from Corral, Chile, *H. Krause* in Herb. München, which I have not seen. No description given.

Spergularia oligantha Philippi in Anal. Univ. Chil. lxxxi. 770 (1892). Type not found in Museo Nacional, Santiago, Chile.

Excluded Species

Spergularia arvensis Camb. in St. Hil. Fl. Bras. Mer. ii. 179 (1829), is *Spergula arvensis* L.

Spergularia leptophylla G. Don, Gen. Hist. Dichl. Pl. 425 (1831), based upon *Arenaria leptophylla* Cham. & Schlecht. in Linnaea, v. 233 (1830).

Lepigonum mollugineum Kindb. Synop. Lepig. 11 (1856), based upon *Alsine mollugina* Lagasca, Gen. et Spec. 13, no. 170 (1815), which is a *Drymaria.*

Lepigonum paradoxum Kindb. Synop. Lepig. 15 (1856), based upon *Arenaria paradoxa* Bartl. ex Presl, Rel. Haenk. ii. 15 (1831), which certainly is not a *Spergularia.*

Tissa alsinella Greene ex C. F. Baker, West. Am. Plants, ii. 18 (1903), *nomen nudum.* Plant cited is not a *Spergularia.*

Spergularia squarrosa Muschler in Engl. Bot. Jahrb. xlv. 461 (1911); Macbride, Field Mus. Pub. Bot. xiii. pt. 2, 632 (1937); both based upon *Weberbauer* 57 (B., photo. in F. M., G.) which is a *Drymaria.*

Explanation of Plates 589–596

Plate 589. Spergularia macrotheca: fig. 1a, sepals with capsule, × 5, from the Presidio, San Francisco, California, *Heller* 5700; fig. 1b, seed, × 25, from 5700; fig. 1c, style, × 5, from Monterey, California, *Elmer* 4387.

S. macrotheca var. leucantha: fig. 1d, style, × 5, from San Bernardino, California, *S. B. Parish* 4755.

S. macrotheca var. longistyla: fig. 1e, seed, × 25, from the type, from near Altamont, Alameda Co., California, *G. B. & R. P. Rossbach* 611; fig. 1f, style, × 5, from 611.

S. canadensis: fig. 2a, sepals with capsule, × 5, from Lower Argyle, Yarmouth Co., Nova Scotia, *Fernald et al.* 21189; fig. 2b, a non-papillose seed, × 25, from Bathurst, New Brunswick, *Blake,* August 13, 1913; fig. 2c, a papillose seed, × 25, from capsule of *Fernald* 21189; fig. 2d, stipule, × 5, from same plant as fig. 2b.

S. atrosperma: fig. 3a, sepals with capsule, × 5, from the type, from Los Banos Hills, Merced Co., California, *J. T. Howell* 13826; fig. 3b, seed, × 25, from type; fig. 3c, stipule, × 5, from type.

S. mexicana: fig. 4a, sepals with capsule, × 5, from Pachuca, Hidalgo, Mexico, *Pringle* 6913; fig. 4b, stipule, × 5, from 6913; fig. 4c, seed, × 25, from 6913.

S. diandra: fig. 5a, sepals with capsule, × 5, from Hayden Island in the Columbia River, Oregon, *J. C. Nelson* 2958; fig. 5b, seed, × 25, from 2958; fig. 5c, stipule, × 5, from 2958.

S. rubra: fig. 6a, sepals with capsule, × 5, from Martha's Vineyard Island, Massachusetts, *F. C. Seymour* 1198; fig. 6b, seed, × 25, from 1198; fig. 6c, stipule, × 5, from 1198.

S. Bocconi: fig. 7a, sepals with capsule, × 5, from Pacific Grove, Monterey Co., California, *Heller* 6797; fig. 7b, seed, × 25, from 6797; fig. 7c, stipule, × 5, from 6797.

Plate 590. S. media: fig. 1a, sepals with capsule, × 5, from Syracuse, New York, *Wiegand* 6409; fig. 1b, stipule, × 5, from 6409; fig. 1c, seed, × 25, from 6409.

S. echinosperma: fig. 2a, sepals with capsule, × 5, from Corpus Christi, Texas, *Benke* 5360; fig. 2b, seed, × 25, from Pecos, Texas, *E. J. Palmer* 34027; fig. 2c, stipule, × 5, from 34027.

S. marina: fig. 3a, sepals with capsule, × 5, from Aliso Canyon, Laguna Beach, Orange Co., California, *D. L. Crawford,* July 26, 1916; fig. 3b, papillose seed, × 25, from same plant as fig. 3a; fig. 3c, smooth seed, × 25, from Balboa, Orange Co., California, *Abrams* 6565; fig. 3d, seed with a few scattered papillae, × 25, from Tracadie, Gloucester Co., New Brunswick, *Blake* 5648; fig. 3e, stipule, × 5, from same plant as fig. 3a.

S. congestifolia: fig. 4a, sepals with a nearly mature capsule, × 5, from the type, from Mollendo, Prov. Islay, Peru, *I. M. Johnston* 3567; fig. 4b, stipule, × 5, from type.

S. arbuscula: fig. 5a, long blunt sepals with hidden capsule, × 5, from Limari, Frai Jorge, Prov. Coquimbo, Chile, *Werderman* 894; fig. 5b, short, reflexed, acute sepals with capsule, × 5, from vicinity of Aguada de Miguel Diaz, Prov. Antofagasta, Chile, *I. M. Johnston* 5357; fig. 5c, short, broad sepals with capsule, × 5, from just north of Caldera, Prov. Atacama, Chile, *I. M. Johnston* 5066; fig. 5d, seed, × 25, from 5066; fig. 5e, stipule, × 5, from Puerto de Chañaral, Prov. Atacama, Chile, *I. M. Johnston,* 4753.

Plate 591. The type of *"Arenaria foliis linearibus longitudine internodiorum"* Linn. Hort. Cliff.; therefore the type of *Arenaria rubra β. marina*

L. Sp. Pl. (see discussion of *S. marina*). From the Clifford Herbarium at the British Museum by the courtesy of Mr. J. RAMSBOTTOM.

PLATE 592. The plant cited as the basis for "*Arenaria foliis longitudine internodiorum*" Gronovius, Fl. Virg., which is a synonym of *Arenaria rubra* β. *marina* L. Sp. Pl. (see discussion of *S. marina*). From the Clayton Herbarium at the British Museum by the courtesy of MR. J. RAMSBOTTOM.

PLATE 593. S. FASCICULATA: FIG. 1a, sepals with capsule, × 5, from Arequipa, Dept. Arequipa, Peru, *G. H. H. Tate* 1197; FIG. 1b, seed, × 25, from 25–2600 m. alt. above Arequipa, Dept. Arequipa, Peru, *Pennell;* FIG. 1c, stipule, × 5, from *Tate* 1197; FIG. 1d, style, × 5, from same plant as FIG. 1b.

S. ANDINA: FIG. 2a, sepals with capsule, × 5, from TYPE, from Azangaro, Dept. Puno, Peru, *Lechler* 1772; FIG. 2b, seed, × 25, also from Azangaro, *Weberbauer* 456; FIG. 2c, stipule, × 5, from same plant as fig. 2a.

S. DEPAUPERATA: FIG. 3a, sepals with capsule, × 5, from TYPE COLLECTION from Chile, *Gay;* FIG. 3b, seed, × 25, from the cordillera of Chillan, Prov. Nuble, Chile, *Felsen* 142; FIG. 3c, stipule, × 5, from Gay.

S. PISSISI: FIG. 4a, sepals with capsule, × 5, from Quebrada Alfalfa, Prov. Atacama, Chile, *I. M. Johnston* 5985; FIG. 4b, seed, × 25, from Banos del Toro, Prov. Coquimbo, Chile, *Espinosa,* February 26, 1938; FIG. 4c, stipule, × 5, from 5958.

S. CREMNOPHILA: FIG. 5a, sepals with capsule, × 5, from TYPE, from Aguada Cachina, Prov. Antofagasta, Chile, *I. M. Johnston* 5683; FIG. 5b, a dull, sculptured seed, × 25, from 5683; FIG. 5c, a lustrous, smooth seed, × 25, from near Aguada Grande, Prov. Antofagasta, Chile, *I. M. Johnston* 5821; FIG. 5d, stipule, × 5, from 5683; FIG. 5e, stipule, × 5, from 5821.

PLATE 594. S. ABERRANS: FIG. 1a, sepals with capsule, × 5, from Antofagasta, Chile, *Jaffuel* 1136; FIG. 1b, seed, × 25, from TYPE, from Antofagasta, Chile, *I. M. Johnston;* FIG. 1c, stipule, × 5, from TYPE.

S. STENOCARPA: FIG. 2a, sepals with capsule, × 5, from between Quebrada San Ramon and Paso Malo, Prov. Antofagasta, Chile, *I. M. Johnston* 5177; FIG. 2b, seed, × 25, from vicinity of Paposo, Prov. Antofagasta, Chile, *I. M. Johnston* 5604; FIG. 2c, seed, × 25, from vicinity of Taltal, Prov. Antofagasta, Chile, *I. M. Johnston* 5162; FIG. 2d, stipule, × 5, from 5177.

S. DENTICULATA: FIG. 3a, sepals with capsule, × 5, from Aguada Grande, Prov. Antofagasta, Chile, *I. M. Johnston* 5822; FIG. 3b, seed, × 25, from 5822; FIG. 3c, stipule, × 5, from 5822.

S. CERVIANA: FIG. 4a, sepals with capsule, × 5, from TYPE, from Talcaguano, Prov. Concepcion, Chile, *Chamisso;* FIG. 4b, sepals with capsule, × 5, from Antuco, Prov. Nuble, Chile, *Pöppig* 125; FIG. 4c, seed, × 25, from 125; FIG. 4d, stipule, × 5, from TYPE, *Chamisso.*

S. FLORIBUNDA: FIG. 5a, sepals with capsule, × 5, from the TYPE COLLECTION, from vicinity of La Serena, Prov. Coquimbo, Chile, *Gay;* FIG. 5b, seed, × 25, from TYPE COLLECTION, *Gay;* FIG. 5c, stipule, × 5, from TYPE COLLECTION, *Gay.*

S. PYCNANTHA: FIG. 6a, sepals with capsule, × 5, from the TYPE, from Huasco, Prov. Atacama, Chile, *Jaffuel* 1164; FIG. 6b, seed, × 25, from TYPE; FIG. 6c, stipule, × 5, from TYPE.

S. VILLOSA: FIG. 7a, sepals with capsule, × 5, from Pangal, Limache, Prov. Valparaiso, Chile, *G. Looser,* October 12, 1926; FIG. 7b, a non-papillose seed, × 25, from Arauco, Prov. Arauco, Chile, *Pennell* 12933; FIG. 7c, a papillose seed, × 25, from Campana, Prov. Buenos Aires, Argentina, *Parodi* 8608; FIG. 7d, stipule, × 5, from same plant as FIG. 7a.

S. CONFERTIFLORA: FIG. 8a, sepals with capsule, × 5, from the TYPE COLLECTION, from Juan Fernandez Islands, Chile, *Bertero* 1431; FIG. 8b, seed, × 25, from 1431; FIG. 8c, stipule, × 5, from 1431.

PLATE 595. S. RAMOSA: FIG. 1a, sepals with capsule, × 5, from Tumbaya, Prov. Jujuy, Argentina, *Venturi* 4900; FIG. 1b, papillose seed, × 25, from Santa Lucia, Dept. San José, Uruguay, *Osten* 21691; FIG. 1c, a smooth seed,

× 25, from Campana, Prov. Buenos Aires, Argentina, *Parodi* 11326; FIG. 1d, stipule, × 5, from 21691.

S. RAMOSA var. DIFFUSA: FIG. 1e, seed, × 25, from the TYPE, from Burruyacu, Prov. Tucuman, Argentina, *Venturi* 7722; FIG. 1f, sepals with capsule, × 5, from TYPE; FIG. 1g, stipule, × 5, from TYPE.

S. SPRUCEANA: FIG. 2a, sepals with capsule, × 5, from the TYPE, from the Andes of Ecuador, *Spruce* 5444; FIG. 2b, seed, × 25, from TYPE; FIG. 2c, stipule, × 5, from TYPE.

S. PLATENSIS: FIG. 3a, sepals with capsule, × 5. from Los Angeles, California, *Parry* 15, 1881; FIG. 3b, a papillose seed, × 25, from 15; FIG. 3c, a non-papillose seed, × 25, from Otay, Riverside Co., California, *Orcutt* 1201; FIG. 3d, stipule, × 5, from Rio Sali, Prov. Tucuman, Argentina, *Venturi* 1908.

S. PLATENSIS var. BALANSAE: FIG. 3e, sepals with capsule, × 5, from TYPE, from Paraguay, *Balansa* 2271; FIG. 3f, stipule, × 5, from TYPE.

S. COLLINA: FIG. 4a, sepals with capsule, × 5, from Mollendo, Prov. Islay, Peru, *A. S. Hitchcock* 22355; FIG. 4b, seed, × 25, from 22355; FIG. 4c, stipule, × 5, from 22355.

PLATE 596. S. GRANDIS: FIG. 1a, sepals with capsule, × 5, from San Jose, Prov. Santa Catharina, Brazil, *Ule* 472; FIG. 1b, seed, × 25, from 472; FIG. 1c, stipule, × 5, from 472.

S. LEVIS: FIG. 2a, sepals with capsule, × 5, from Montevideo, Uruguay, *Sello*, October 22; FIG. 2b, seed, × 25, from Concepcion del Uruguay, Prov. Entre Rios, Argentina, *Lorentz*, October, 1875; FIG. 2c, stipule, × 5, from Montevideo, Uruguay, *Gibert*, October, 1858.

S. RUPESTRIS: FIG. 3a, sepals with capsule, × 5, from Montevideo, Uruguay, *Sello* d394; FIG. 3b, seed, × 25, from 394; FIG. 3c, stipule, × 5, from 394.

S. COLOMBIANA: FIG. 4a, sepals with capsule, × 5, from the TYPE, from Prov. Bogota, Colombia, *Triana*, 1851–1857; FIG. 4b, stipule, × 5, from the TYPE.

S. PAZENSIS: FIG. 5a, sepals with capsule, × 5, from Talca Chugiaguillo, Dept. La Paz, Bolivia, *Bang* 814; FIG. 5b, seed, × 25, from 814; FIG. 5c, stipule, × 5, from La Paz, Bolivia, *R. S. Williams* 2336.

POTENTILLA GRACILIS Dougl., var. **pulcherrima** (Lehm.), comb. nov. *P. pulcherrima* Lehm. Nov. Stirp. Pug. ii. 11 (1830).

I fail to find in *P. pulcherrima* any specific characters to separate it from *P. gracilis*. In its best development it is distinguished by the heavy white tomentum of the lower leaf-surfaces and by the shorter and more approximate teeth. It seems to be one end of a series, of which *P. gracilis*, var. *rigida* (Nutt.) Wats. (*P. Nuttallii* Lehm.) is at the other. Although Wolf, Mon. Gen. Pot. (1908), followed Rydberg in keeping the three apart, it is noteworthy that in his key and diagnoses he could state only the difference in degree of pubescence and of marginal toothing, specially noting (p. 209) that *P. pulcherrima* is very close to *P. gracilis*.—M. L. FERNALD.

DETERMINATION OF AMPHICARPA, STROPHOSTYLES, GALACTIA AND APIOS BY VEGETATIVE CHARACTERS.—Sterile trifololiate forms of *Apios americana* are often confused with species of *Strophostyles*, *Amphicarpa*, and *Galactia*, and the latter three genera are frequently mis-

understood. Certain specimens in each of the four genera at times superficially approach one another in gross similarity, and are likely to be mistaken in the field or herbarium.

The writer has found certain of the following vegetative characters helpful in identifying these genera in the sterile condition.

	Apios	Strophostyles	Amphicarpa	Galactia volubilis and Varieties
Main stipule at base of petiole.	Linear-setaceous, 1-nerved.	Ovate, lanceolate, 1–3, or 5–7-nerved.	Ovate, 10–12-nerved.	Linear-setaceous, 1-nerved.
Lateral stipule at base of petiolule.	Setaceous, conspicuous, 1-nerved	Oblong-spatulate, lanceolate-oblong, conspicuous, 3-nerved.	Ovate, conspicuous, 3-nerved.	Setaceous, inconspicuous, 1-nerved.
Apex of leaves.	Acute to acuminate.	Obtuse to acutish.	Acute.	Obtuse.
Lowest pair of lateral nerves at base of leaflet.	Inconspicuous.	Conspicuous. Mostly parallel to the curving margins of the leaflets.	Conspicuous. Mostly straight and upwardly divaricate, not parallel to the margins of the leaflets.	Inconspicuous.
Tuberous enlargements.	Large.	None.	Slight.	Slight.
Hairs on stems.	Retrorse.	Retrorse.	Retrorse.	Ascending.

They may be keyed out as follows:

a. Stipule at base of petiole setaceous....*b.*
b. Leaves acute to acuminate at apex.....*Apios americana.*
b. Leaves obtuse or rounded at apex.....*Galactia volubilis* and varieties.
a. Stipule at base of petiole ovate, lanceolate, or oblong-lanceolate....*c.*
c. Stipule at base of petiole 1–3- or 5–7-nerved; stipule at base of petiolule spatulate, oblong-spatulate, or oblong-lanceolate; no underground tuberous enlargement; 2 lateral nerves at base of leaflet arching parallel to margin of leaflet.....*Strophostyles.*
c. Stipule at base of petiole 10–12-nerved; stipule at base of petiolule ovate or broadly lanceolate; slight underground tuberous enlargement; 2 lateral nerves at base of leaflet not arching parallel to margin of leaflet, but directed straight and more divaricate.....*Amphicarpa.*

In his Leguminous Plants of Wisconsin, Dr. Fassett brings out a further difference between *Strophostyles* and *Amphicarpa*, i. e., in *Amphicarpa* the midrib is prolonged at the tip of the leaf-blade into a minute bristle, whereas in *Strophostyles* it is not prolonged. This

difference accounts for the leaves of *Amphicarpa* usually appearing acute at the apex, whereas those of *Strophostyles* appear obtuse or only acutish.—Julian A. Steyermark, Field Museum of Natural History, Chicago, Illinois.

Spring Flora of Missouri.—In his new "Spring Flora of Missouri," [1] which treats some fourteen hundred flowering plants in blossom by June first, Dr. Julian A. Steyermark has brilliantly succeeded in combining simplified terminology with precise scientific accuracy and authoritativeness. Though he dismisses the Gramineae, Cyperaceae and Juncaceae with brief mention, Dr. Steyermark points out that these groups of plants are to form the basis of a future publication devoted exclusively to them.

Written particularly for all persons interested in flowering plants, the book is well printed, with few typographical errors, on an excellent grade of paper and is bound in a durable buckram. Though designed to include the spring flora of neighboring states, as well as of Missouri, its use would seem to be restricted primarily to the latter, especially since distribution data for each species are given for Missouri alone. From a teacher's point of view, the utility of the book would have been further enhanced by brief mention, if only by means of abbreviations, of the North American range of each species. Along with the concise, non-technical descriptions of each species, Dr. Steyermark has occasionally included information regarding poisonous properties, and, in the case of dermatitis caused by Poison Ivy, he has even suggested detailed remedies. Such added notes serve to make the book of greater value and interest to the layman.

The non-technical keys to such difficult families of plants as the Umbelliferae, wherein dependence upon mature fruit-characteristics has been heretofore an almost universal practice, are constructed upon simpler but, perhaps, as equally accurate leaf- and inflorescence-characters. Whenever it has been necessary to use a convenient technical term, an accompanying diagram often serves to make the meaning clear. Furthermore, a short glossary of the relatively few scientific terms employed is provided at the back of the book. Adjacent to the glossary of terms there is an interesting list of "English Meanings of Scientific Species Names," a feature which, for the average layman or college student, should add much to an understanding of taxonomic nomenclature, especially since a knowledge of Latin and Greek is no longer a foundation-stone of education. Besides the diagrams illustrating technical terms, the keys are replete with line-drawings which add significantly to the general usage of the book.

Apparently as a result of employing several artists for illustrating the book, there is a pronounced lack of uniformity in styles of drawing. For example, on Plate 100, page 365, *Viola cucullata* is drawn

[1] Steyermark, J. A. *Spring Flora of Missouri.* vii. and 582 pp. Published by the Missouri Botanical Garden (St. Louis) and the Field Museum of Natural History (Chicago). Set up and printed by the Ovid Bell Press, Fulton, Mo. 1940.

with heavily shaded leaves, whereas the adjacent illustrations, as of the leaves of *V. papilionacea,* are represented (except for veins) merely in outline; or, on Plate 138, page 480, the illustration of *Penstemon Cobaeus* (fig. 3) is heavily shaded, whereas the other species figured on the page are not. Plates 21 (p. 95), 22 (p. 97) and 23 (p. 99), mainly of the Orchidaceae, appear to be done uniformly with heavy shading, but many of the plates of other families are figured by more simple, outline drawings. Yet such variation in style of illustration is not a serious fault, for it scarcely detracts from the high level of excellence of the entire work.

Differences of opinion may well arise with respect to Dr. Steyermark's taxonomic treatment of such plants as *Erythronium albidum* and *E. mesochoreum* which, by him, are maintained as distinct species. Yet Dr. H. W. Rickett[1] has clearly shown that, at least for certain regions in Missouri, the specific distinctions between the two "species" of *Erythronium* definitely break down, so that *E. mesochoreum* is more logically to be considered a variant ("ecotype") of *E. albidum.*

On the whole, however, the "Spring Flora of Missouri" is carefully and critically done, so that it should find wide and enthusiastic reception at the hands of all those amateurs and professionals alike, who enjoy becoming acquainted with the rich native flora of Missouri. Indeed, this book may well pave the way for more comprehensive state or regional manuals, written in a less technical fashion than has been adhered to heretofore, without a loss of scientific accuracy.—William B. Drew, University of Missouri, Columbia, Mo.

[1] Rhodora, xxxix. 101–105 (1937).

Volume 42, no. 497, including pages 145–200 and plates 593–596, was issued 11 May, 1940.

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